

BioRegional

solutions for sustainability

BedZED seven years on

The impact of the UK's best known eco-village and its residents - executive summary



About BedZED

The Beddington Zero Energy Development, or BedZED, is the UK's best-known eco-village. The multi-award winning development is one of the most coherent examples of sustainable living in the UK.

BedZED was initiated by BioRegional and developed by Peabody in partnership with BioRegional and Bill Dunster Architects (now BDa ZEDfactory). BedZED is owned and managed by Peabody.

Located in Hackbridge, south London, BedZED comprises 100 homes, community facilities and enough workspace for 100 people. Residents have been living at BedZED since March 2002.

Many thanks to all of the residents who took part in the monitoring by answering questions and allowing us access to their meters. Without their continued input we would be unable to gauge successes or recommend improvements, for BedZED and for future developments.

About BioRegional

This report was written by Jessica Hodge of BioRegional and Julia Haltrecht an environmental consultant with experience in post occupancy evaluation.

BioRegional is an entrepreneurial charity, which invents and delivers a wide range of practical solutions for sustainability. We are perhaps best known for our work on BedZED.

Our role at BedZED during the planning and construction stages was to ensure that sustainability was considered at every step. We particularly focussed on the green transport plan, energy strategy, sustainable construction materials strategy and the green lifestyles programme.

BioRegional has had its offices at BedZED since the site was completed and we run a visitor centre including a show home, guided tours and training.

www.bioregional.com

About Peabody

Founded in 1862, Peabody is one of London's best known and largest housing associations. Peabody owns or manages over 19,000 properties housing some 50,000 people. As well as providing affordable housing it offers a range of learning, volunteering, personal development and community activities. Peabody's mission is to make London a city of opportunity for all by ensuring as many people as possible have a good home, a real sense of purpose and a strong feeling of belonging.

www.peabody.org

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Executive Summary

BedZED was designed to minimise its ecological impact both in construction and operation – to help residents live within their fair share of the world's resources. Monitoring progress towards achieving these targets is vital in order to assess the effectiveness of the development, identify areas for further improvement and highlight lessons that can be learnt and applied to future developments.

During 2007, BioRegional interviewed 71 households (out of 100) about food, transport and waste habits, and their feelings about living at BedZED. We took meter readings to record water, electricity and heat consumption and carried out waste audits.

Energy and water use

We found that BedZED households use 2,579 kWh of electricity per year which is 45% lower than the average in Sutton. While the biomass Combined Heat and Power (CHP) plant is not in use, BedZED uses gas to power the district heating system. On average, households use 3,526 kWh of heat (from gas) per year – 81% less than the average in Sutton.

We found that residents only use 72 litres of mains water per day, topped up by 15 litres of recycled or rainwater. This is less than half of the local average.

Green lifestyles

86% of BedZED residents buy organic food and 39% grow some of their own food and although this is encouraging, there is scope to build on this. While BedZED residents have much lower car ownership and drive far fewer miles, they also fly more so the overall impact of transport is slightly higher than for the average resident in Sutton. Through waste audits with ten households, we found that 60% of waste by weight is recycled or composted, but this rate is likely to be lower for all households – people tend to try harder to recycle and compost while they are being audited.

Quality of Life

The sense of community at BedZED, together with BDa ZEDfactory's innovative design, is the aspect of BedZED most valued by the residents. When we asked residents to name one or two things

they particularly like about BedZED the sense of community was the most popular answer, followed by the design, sustainability and a sense of wellbeing (quietness, quality of light and the feeling of space were all mentioned).

84% of residents felt that the community facilities were better here than in previous neighbourhoods and only one resident, out of 70 who answered this question, felt they were worse.

People living at BedZED know an average of 20 of their fellow residents by name and one resident was able to name 150 of her neighbours! This is significantly higher than for Hackbridge (excluding BedZED) where the average is eight.

Ecological and carbon footprint

The ecological footprint of the 'average' BedZED resident is 4.67 global hectares (equivalent to needing 2.6 planets of resources if everyone in the world lived like this) and a carbon footprint of 9.9 tonnes (for truly sustainable living this would be around 1 tonne). If the biomass CHP was working and BedZED was zero carbon as designed, the average resident would have an ecological footprint of 4.32 global hectares (2.4 planets' worth) and a carbon footprint of 8.9 tonnes. A keen resident, who made significant efforts to reduce their impact, could achieve an ecological footprint of three global hectares (equivalent to 1.7 planets) and a carbon footprint of 6 tonnes.

While this is a significant decrease in ecological and carbon footprint compared to the UK average, it is still not sustainable. The limiting factor is that so much of BedZED residents' impact occurs outside of the estate; their schools, workplaces and the goods and food that they buy for example, and we have not so far been able to influence this. In 2005, Sutton Council committed to becoming a 'One Planet Borough'¹ by 2025 and will be working with BioRegional to reduce the footprints of the whole borough. By working at this scale, and applying lessons learnt from BedZED to the whole borough, we hope that that we can make significant reductions in ecological footprint, for BedZED and for all Sutton residents.

1. BioRegional's One Planet programme is a global initiative based on 10 principles of sustainability developed by BioRegional and WWF

The aim of this report

This report gives an insight into how BedZED is performing. We look at BedZED's technology as well as the lifestyles of the people who live here. This report does not look at the businesses on-site, but for one example of how a BedZED office performs; refer to BioRegional's One Planet Action Plan¹ which includes energy and water consumption and ecological footprint.

BedZED was designed to minimise its ecological impact both in construction and operation – to help residents live within their fair share of the world's resources. Some of the key operational aims were as follows:

- reduce water consumption compared to the UK average by 33%
- reduce electricity consumption compared to the UK average by 33%
- reducing space heating needs compared to the UK average by 90%
- reduce private fossil fuel car mileage to 50% of UK average
- eliminate carbon emissions due to energy consumption

Monitoring progress towards achieving these targets is vital in order to assess the effectiveness of the development, identify areas for further improvement and highlight lessons that can be learnt and applied to future developments.

Where we look at consumption of natural resources, energy and water for example, we compare the findings to local (Hackbridge or Sutton) or UK averages, as well as to current and future building regulations, and to past BedZED monitoring. BedZED is much written about in theses, books, reports, and on the internet – putting BedZED into a search engine returns over 48,000 results – yet there is very little written about performance. The monitoring reports we use for comparisons in this report were both written by people employed by BioRegional or Peabody at the time of writing, and are detailed in the following paragraphs:

Toolkit for Carbon Neutral Developments Part 2, October 2003, Nicole Lazurus, BioRegional.

The toolkit is a practical guide to producing carbon neutral developments and how to afford them. It is based on the achievements at BedZED, describing measures taken in the scheme to reduce environmental impact. It includes technical descriptions, monitoring results and financial mechanisms that have allowed the innovations at BedZED to become a reality.

The toolkits (Part 1 is the BedZED Construction Materials Report) are available from BioRegional www.bioregional.com or tel +44 (0) 20 8404 4880.

The BedZED lessons (Thesis) MSc Architecture: Advanced Environmental and Energy Studies, University of East London, November 2005, Simon Corbey.

A post construction review of BedZED conducted in 2004 which then draws on this review and other research to conclude the BedZED lessons – the achievements and limitations of the development and the subsequent ramifications of these conclusions. The thesis then makes recommendations for future developments. 22 questionnaires were completed.

To request a copy of this thesis please email simon.corbey@cutthecarbon.com.

BedZED Resident Satisfaction Survey Report, Rachel Ellis, Peabody, May 2004

This report details BedZED residents likes and dislikes of living at BedZED, and includes feedback on satisfaction with their home, the location and neighborhood, refuse and recycling facilities, energy use, facilities at BedZED, personal transport and sense of community. 38 surveys were completed.

To request a copy of this report please contact the Peabody www.peabody.org.uk.

1. Available on BioRegional's web site and updated annually www.bioregional.com/actionplan